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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/820,441	04/08/2004	Max Herla	HERLA	7169
20151	7590	01/31/2006	EXAMINER	
HENRY M FEIEREISEN, LLC 350 FIFTH AVENUE SUITE 4714 NEW YORK, NY 10118			GATES, ERIC ANDREW	
			ART UNIT	PAPER NUMBER
			3722	

DATE MAILED: 01/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/820,441	HERLA, MAX	
	Examiner	Art Unit	
	Eric A. Gates	3722	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 8 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to Applicant's amendment filed on 23 November 2005.
2. The indicated allowability of claim 5 is withdrawn in light of reconsideration of Muller (U.S. Patent 3,806,272) in view of Date et al (U.S. Patent 6,264,409). Rejections based on the newly cited reference(s) follow.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the drive shaft having a tube extending into the central bore of the tie rod of claim 5 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering

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of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 11, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Akamatsu et al. (U.S. Patent Publication 2001/0048858 A1).
6. Regarding claim 1, Akamatsu et al. discloses a spindle unit 24 for a machine tool 21, comprising: a drive unit (not shown but inherent) having a drive shaft 50; a spindle head assembly 24 having a hollow spindle head shaft 25 driven by the drive unit; a tie rod 49 arranged for axial displacement in the hollow spindle head shaft 25 between rearward and forward positions and mechanically coupled with the drive shaft 50; a collet 48 placed in a pocket of the spindle head shaft 25 and interacting with the tie rod 49 to clamp a tool T when the tie rod 49 assumes a rearward position, and to expel the tool T when the tie rod 49 assumes a forward position; and a shifting unit (hydraulic

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cylinder, not shown, see paragraph 11) for axially moving the drive shaft 50 together with the tie rod 49.

7. Regarding claim 11, Akamatsu et al. discloses wherein the shifting unit is constructed for operation by hydraulic means.

8. Regarding claim 13, Akamatsu et al. discloses a method for operating a spindle unit 24 for a machine tool 21 having a drive unit (not shown but inherent) with a drive shaft 50 and a spindle head assembly 24 with a tie rod 49, comprising the steps of: placing a tool T in a collet 48 received in the spindle head assembly 24; moving the drive shaft 50 backwards in an axial direction to shift the tie rod 49 into a rearward position to thereby cause the collet 48 to clamp the tool T; and moving the drive shaft 50 forward in the axial direction to shift the tie rod 49 in the axial direction to a forward position to thereby expel the tool T from the collet 48.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akamatsu et al. in view of Kameyama et al. (U.S. Patent 5,009,554).

11. Regarding claim 2, Akamatsu et al. discloses wherein the drive shaft 50 and the tie rod 49 are detachably coupled to one another. Akamatsu et al. does not distinctly

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disclose wherein the spindle head assembly and the drive unit are detachably connected to one another.

12. Kameyama et al. teaches a drive unit 9 and a spindle head assembly 6 that are detachably connected to one another through the quill 3 and cam followers 11 for the purpose of being able to remove the spindle during maintenance. Therefore it would have been obvious to one having ordinary skill in the art to have combined the machine tool of Akamatsu et al. with the detachable spindle head assembly of Kameyama et al. in order to facilitate maintenance of the machine tool.

13. Regarding claim 3, Akamatsu et al. discloses the invention substantially as claimed, except Akamatsu et al. does not disclose the spindle head shaft to be constructed as a spline shaft, or the drive shaft having an end face constructed as a hollow wheel to complement the spline end of the spindle head shaft to enable coupling. Kameyama et al. teaches a spindle head shaft 6 that has one end facing the drive shaft 13b and constructed as a spline shaft 15, and said drive shaft 13b having an end face constructed as a hollow wheel 16 to complement the one end 15 of the spindle head shaft 6 to for the purpose of enabling coupling between the two parts. Therefore it would have been obvious to one having ordinary skill in the art to have combined the spindle unit of Akamatsu et al. with the spindle head shaft and drive shafts of Kameyama et al. in order to have an attachment between the two that is axially shiftable while still allowing rotation.

14. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akamatsu et al. in view of Date et al. (U.S. Patent 6,264,409).

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15. Regarding claim 4, Akamatsu et al. discloses the invention substantially as claimed, except Akamatsu et al. does not disclose wherein the drive shaft has a central bore for transporting a material, said tie rod having a tube extending into the central bore and being removable therefrom.

16. Date et al. teaches a drive shaft 29 having a central bore 61 and a tie rod 23 having a tube extending into the central bore 61 and being removable therefrom, all for the purpose of transporting a material (see page 5, lines 53-55).

17. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Date et al. in view of Muller et al. (U.S. Patent 3,806,272).

18. Regarding claim 5, Date et al. discloses a spindle unit 1 for a machine tool, comprising: a drive unit 11 having a drive shaft 29; a spindle head assembly 1 constructed for receiving a tool and having a hollow spindle head shaft 1 driven by the drive unit 11; a tie rod 23 arranged for axial displacement in the hollow spindle head shaft 1 and mechanically coupled with the drive shaft 29; and a shifting unit 33 for axially moving the drive shaft 29 together with the tie rod 23, wherein the tie rod 23 has a central bore 75 for transporting a material (see page 6, lines 46-51). Date et al. does not disclose said drive shaft having a tube extending into the central bore of the tie rod and being removable therefrom.

19. Muller et al. teaches the use of a drive shaft 33 that has a tube 33 extending into the central bore of a tie-rod 22 and being removable therefrom, for the purpose of allowing tool changes without having to uncouple the tie-rod from the chucking drive and recouple it with the working drive. Therefore it would have been obvious to one

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having ordinary skill in the art to have combined the spindle unit of Date et al. with the drive shaft and tie-rod of Muller et al. in order to have a spindle unit that is simplified with regard to operation and design.

20. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akamatsu et al. in view of Chen (U.S. Patent 6,464,435).

21. Akamatsu et al. discloses the invention substantially as claimed, except Akamatsu et al. does not disclose the drive shaft and tie rod to be formed as one piece. Chen teaches a drive shaft 42 and tie rod 42 which are formed from one piece for the purpose of simplification of the spindle unit assembly. Therefore it would have been obvious to one having ordinary skill in the art to have combined the spindle unit of Akamatsu et al. with the drive shaft and tie rod combination of Chen in order to have a simpler assembly.

22. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akamatsu et al. in view of Holtey (U.S. Patent 5,322,494).

23. Akamatsu et al. discloses the invention substantially as claimed, except Akamatsu et al. does not disclose the drive unit to have a rotor mounted on the drive shaft or a stator which completely surrounds the rotor independent of a displacement position of the shifting unit.

24. Per claim 7, Holtey teaches a drive unit including an electric motor 19 having a rotor 93 mounted on the drive shaft 59 for the purpose of providing support to the drive shaft. Therefore it would have been obvious to one having ordinary skill in the art to

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have combined the spindle unit of Akamatsu et al. with the rotor of Holtey in order to provide the drive shaft more rotational stability.

25. Per claim 8, Holtey teaches the electric motor 19 to include a stator 99 that completely surrounds the rotor 93 independent of displacement position of the shifting unit for the purpose of providing protection to the rotor during operation. Therefore it would have been obvious to one having ordinary skill in the art to have combined the spindle unit of Akamatsu et al. with the stator of Holtey in order to provide a more stable drive unit.

26. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akamatsu et al. in view of Wahlstrom (U.S. Patent 2,995,069).

27. Akamatsu et al. discloses the invention substantially as claimed, except Akamatsu et al. does not disclose an axially displaceable bearing assembly for support of the drive shaft. Wahlstrom teaches a drive shaft 89 with an axially displaceable bearing assembly 52 for the purpose of providing moving support of the drive shaft. Therefore it would have been obvious to one having ordinary skill in the art to have combined the drive shaft of Akamatsu et al. with the bearing assembly of Wahlstrom in order to provide support to the drive shaft during axial movement of the drive shaft.

28. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akamatsu et al. in view of Wahlstrom and further in view of Kameyama.

29. The modified invention of Akamatsu et al. discloses the invention substantially as claimed, except Akamatsu et al. does not disclose the bearing assembly having bearing sleeves for support of opposite ends of the drive shaft. Kameyama teaches the drive

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shaft 13b having opposite ends with bearing assemblies 14a and 14b for the purpose of providing support to the opposite ends of the drive shaft. Therefore it would have been obvious to one having ordinary skill in the art to have combined the modified bearing assembly of Akamatsu et al. with the bearings of Kameyama in order to provide axially displaceable bearings on both ends of the drive shaft.

30. Claims 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akamatsu et al. in view of Mitchell (U.S. Patent 4,583,894).

31. Akamatsu et al. discloses the invention substantially as claimed, except Akamatsu et al. does not disclose a sensing device constructed for measuring an axial position of the drive shaft and thereby implementing an indirect measurement of an axial position of the tie rod.

32. Regarding claims 12 and 14, Mitchell teaches a sensing device 208 constructed for measuring an axial position of the drive shaft 70 and thereby implementing an indirect measurement of an axial position of the tie rod 148 for the purpose of locking the drive shaft 70 and tie rod 148 during tool exchange. Therefore it would have been obvious to one having ordinary skill in the art to have combined the spindle unit of Akamatsu et al. with the sensing device of Mitchell in order to know the positions of the drive shaft and tie rod during operation of the spindle unit.

Response to Arguments

33. Applicant's arguments with respect to claims 1 and 13 have been considered but are moot in view of the new ground(s) of rejection.

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34. For the reasons as set forth above, the rejections are maintained.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric A. Gates whose telephone number is 571-272-5498. The examiner can normally be reached on Monday-Thursday 7:45-6:15.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Boyer Ashley can be reached on 571-272-4502. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



EAG
26 January 2006



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SUPERVISORY PATENT EXAMINER